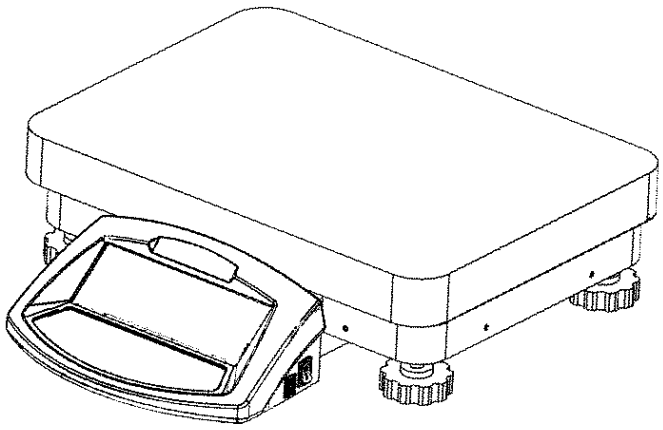
Adam Equipment

PGL SERIES

(P.N. 9326, Revision C5, March 2009)



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Easy Reference:

Model name of the scale:	
Serial number of the unit:	
Software revision number (Displayed when power is first turned on):	
Date of Purchase:	
Name of the supplier and place:	

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2.0 INTRODUCTION

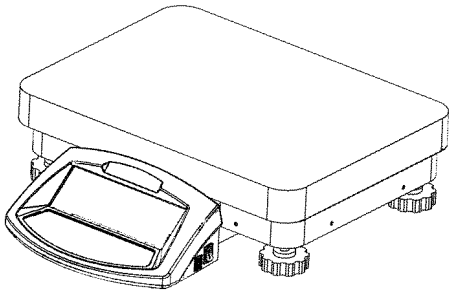
Thank you for selecting the PGL Balance.

This Instruction Manual will familiarize you with the installation, accessories, trouble-shooting, after sales service information, general maintenance of the balance, etc. and will guide you through the various applications.

Please read this Manual thoroughly before starting the operation. If you need any clarifications, feel free to contact your supplier or Adam Equipment.

PRODUCT OVERVIEW

The PGL balances are ideal for laboratory and general purpose weighing. The balances can also be used for some advanced weighing functions.



PGL series

- Multiple weighing units
- Capacity tracker
- Date and time
- Easy to use, sealed keypad
- Below balance weighing facility
- Password protection
- Security locking point (up to PGL 8001)
- Robust metal casing

FEATURES:

- Large easy to read LCD display with backlight
- Standard applications include weighing, check weighing, percentage weighing, parts counting, and density determination
- Bi-directional RS-232 interface
- Can be configured to print a GLP Compliant report after each calibration to include the time, date, balance number and a verification of the calibration

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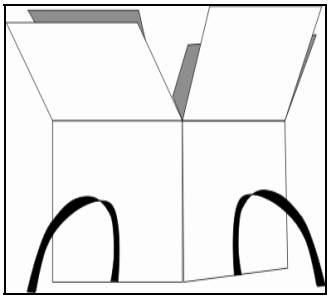
3.0 SET UP

3.1 UNPACKING AND SETTING UP YOUR SCALE

Remove the balance from the packing by carefully lifting it out of the box. Inside the box you will find everything needed to start using the balance-

	✓ AC adapter ✓ Stainless Steel Top Pan ✓ Draught shield (for mg models only) ✓ This User Manual

3.2 ASSEMBLING THE BALANCE (PGL 203 TO PGL 8001)

● Locate the balance on a solid surface, free from vibration
● Gently place the 4 pan supports (if not already fitted) and then the stainless steel pan on the weighing platform
● Place the draught shield frame and the top cover around the pan (PGL 203, 303 models only)
● Level the balance using the adjustable feet and spirit level
● Connect power to the balance
● For best performance, let the balance warm up for 30 minutes and calibrate before using

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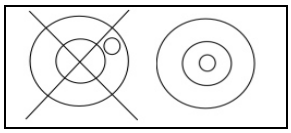
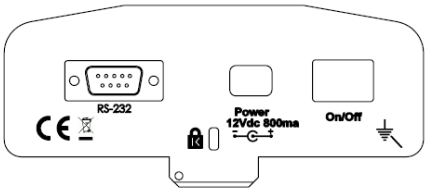
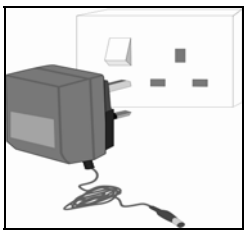
3.3 LEVELLING THE BALANCE

	After placing the balance in a suitable place, level it by using the spirit level on the rear of the balance. To level the balance turn the two adjustable feet at the rear of the balance until the bubble in the spirit level is centered.

3.4 WARM-UP TIME

 	Attach the power supply cable to the connector on the rear of the balance. Plug the power supply module into the mains. The display will indicate the balance serial number (if set) and the software revision number followed by the capacity of the balance. Next the balance will run a self-test by displaying all segments followed by a symbol indicating the balance is in busy mode. If the balance serial number is not set the display will show dashes. The display will show zeroes accompanied by the **→0←** symbol.
Before you start weighing, you have to wait for the balance to achieve a stable internal temperature.	
	A stable sign **~** is shown when the balance is in stable condition. It will turn off if the balance is not stable. Exact zero is shown when the **"→0←"** symbol is on to the left of the display area.

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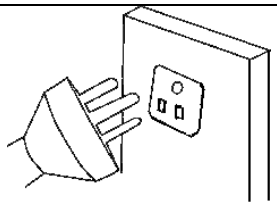
3.5 LOCATING AND PROTECTING YOUR SCALE

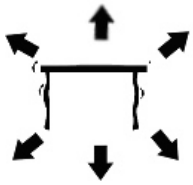
In order to keep your scale functioning at its best we suggest that you do the following:

Avoid extremes of temperature. Do not place in direct sunlight or near air conditioning vents.

Make sure the scale is located on a strong table and free from vibration.

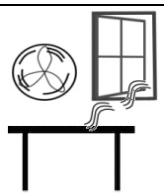


Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors. Use only the factory approved power adapter supplied with the machine.

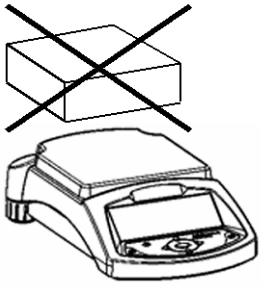


Keep free from vibration. Do not place near heavy or vibrating machinery.

Avoid high humidity that might cause condensation. Keep away from direct contact with water. Do not spray or immerse the scales in water.



Do not place near open windows, air-conditioning vents or fans that may cause a draft and unstable readings.



Keep the scales clean. Do not stack material on the scale / balance when it is not in use.

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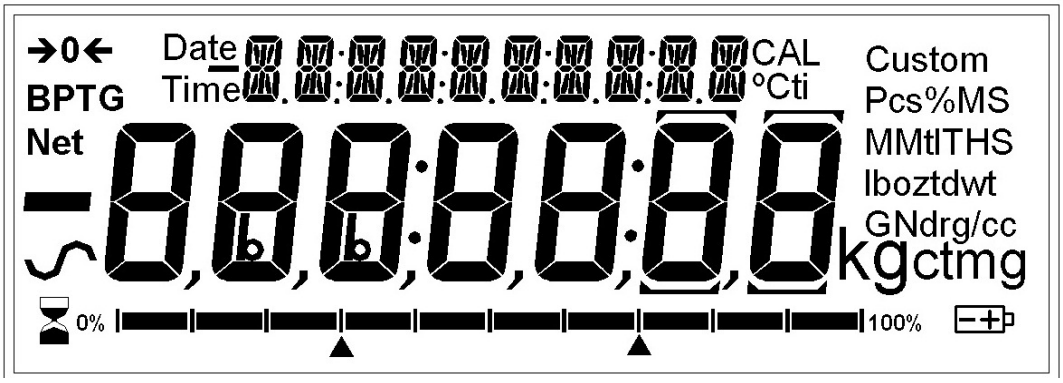
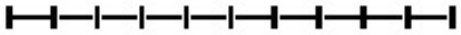
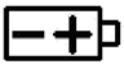
4.0 DISPLAY

The LCD has unique symbols to indicate the following:



→0←	Zero
	Stable
Net	Net weight
	A bar graph indicating the proportion of the balance capacity being used by the weight on the pan
g, kg, ct, oz, lb, ozt, GN, dwt, dr, tl H, tl T, tl S, MM, T, ti, N, g/cc, Pcs, %, M, and S	Symbols shown for the units Not all weighing units are used
	Low Battery symbol. On when the battery voltage is low, signaling the battery should be recharged.

INDICATORS

"**CAL**"	When calibration is occurring or is requested
"**°C**"	When a temperature is shown
"**ti**"	For a time driven calibration
"**Net**"	When a net weight is shown
"**0%**", "**100%**"	When the capacity tracker is showing percent of maximum range used

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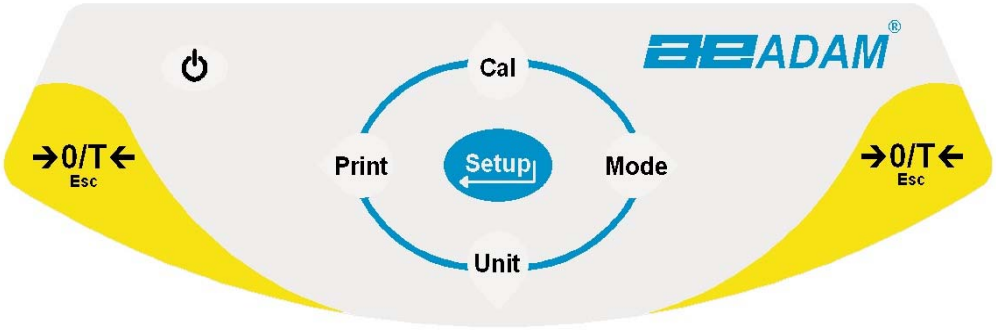
5.0 KEYPAD



The keypad has the following keys to operate the balance.

Keys	Primary function	Secondary function
⏻	To turn the balance to ON or Standby	-
[→0/T←] or [Esc]	A combined zero and tare function	To escape from setup functions and modes
[Unit] / ↓ or [Down]	-Selects weighing units by cycling through a set of enabled units -Scrolls through the options	To decrement or change a displayed value or scroll through options backwards
[Mode] / → or [move right]	Enters the Mode Selection Menu	To advance a flashing digit by one position to the right. To go back by one step during setup functions
[Print] / ← or [move left]	Instructs the balance to print data	To advance a flashing digit by one position to the left
[Cal] / ↑ or [Up]	Starts the calibration function	To increase or change a displayed value or scroll through options forward
[Setup]/ ↵ or [Enter]	Enters the Setup parameters (Supervisor Menus)	Enters a function or saves a value while manually entering unit weight or check weighing limits

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5.1 NUMERIC ENTRY METHOD

To set a value when required, use the keys as given below-

- **[Up]** and **[Down]** keys to increase or decrease the flashing digit
- **[Advance]** and **[Back]** keys to advance or move back the digit
- **[Enter]** key to accept the value

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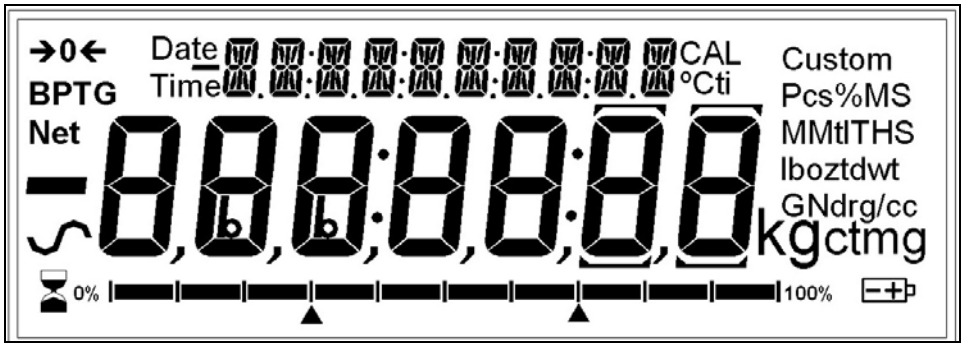
6.0 BASIC OPERATION

6.1 INITIALISATION

1) When the balance is first switched on, it will display the balance serial number (if set), software revision, model capacity and then all segments on the display will be shown. Overall the time taken is usually 5 -10 seconds.



2) If a passcode has been set, the display will show **"PASSCODE"** and the main display will show a zero. In this case you must enter the passcode to continue using the numeric entry method (see section 5.1). A different passcode may be set for a Supervisor to weigh or to have access to the selected User menus. If the passcode has not been set the balance will continue as below.

3) The display will show zero reading along with the zero symbol **"→0←"** and the weighing unit last used. If automatic time calibration is enabled the balance will calibrate after power up and again after the pre-set time interval.

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6.2 PASSCODES

If a passcode has been set to limit access to the weighing functions of the balance the display will show **"PASSCODES"** with the main digit set to zero. The display will change to show 7 digits set to zero with the rightmost digit flashing. Use the numeric entry method (see section 5.1) to enter the code. Make sure to enter the correct passcode to continue. See the Section 12.6 for details.

6.3 WEIGHING

1) Press **[→0/T←]** to zero the balance, if required, **"→0←"** will be displayed

2) Place a mass on the pan and the weight will be displayed

3) If a container is used press **[→0/T←]** to tare the balance (zero the display) when the stable symbol **"~"** is on. **"Net"** will be displayed to indicate that the balance is tared

4) When the display shows zero, place the item to be weighed. Only the net weight will be displayed. The capacity tracker at the bottom of the LCD will indicate the weight graphically with respect to the maximum weighing capacity

5) At any time the **[Unit]** key can be pressed to select another unit. Use the **[Up]** or **[Down]** key to scroll through the units and select the desired unit by pressing the **[Enter]** key, the display will change to show the weight in the selected weighing unit. The available weighing units can be enabled or disabled by the user (see section 12.1). Only weighing units that have been enabled will be cycled through when the **[Unit]** key is pressed

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6.4 WEIGHING UNITS

You can select alternative weighing units to display the weight by pressing the **[Unit]** key. The common weighing units are:

Unit	Symbol	Conversion Factor 1g =	Conversion Factor 1 unit = grams
Grams	g	1	1.0
Kilograms	kg	0.001	1000
Carat	ct	5	0.2
Ounces	oz	0.035273962	28.349523
Pounds	lb	0.0022046	453.5924
Troy ounces	ozt	0.032150747	31.103476
Grains	GN	15.43236	0.0647989
Pennyweights	dwt	0.643014865	1.555174
Newtons	N	0.00980665	101.921623
Custom	Custom	As specified	As specified

If "CUSTOM" unit is selected, the balance will prompt for entering a multiplier by displaying **"MULTIPLIER X,XXX"**, where **"X,XXX"** is the last stored value. Any value ranging from 0.001 to 9.999 may be entered, by which the weight in grams will be multiplied before being displayed. If a multiplier of greater than 1.000 is entered, the number of decimal places displayed will be reduced by one. This multiplier value will be saved for the next use till it is changed by the user.

It is possible to set the balance to display only grams. Grams will always be one of the units enabled, by default.

The balance displays the alternate weighing units with as much precision as possible. For example, the 4000g x 0.1g balance could weigh up to:

	Unit	Maximum	d =
Grams	g	4000.0	0.1
Kilograms	kg	4.0000	0.0001
Carat	ct	20000.0	0.5
Ounces	oz	141.100	0.005
Pounds	lb	8.8180	0.0005
Troy ounces	ozt	128.605	0.005
Grains	GN	61730	2
Pennyweights	dwt	2572.1	0.1
Newtons	N	39.226	0.001

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7.0 FUNCTIONS

When weighing, the user can access the applications that have been enabled (see section 12.2).

- Weighing
- Parts counting
- Percent weighing
- Check weighing
- Density determination

The selectable functions can be enabled using a similar method to the Units above by turning the functions on or off.

7.1 PARTS COUNTING

This allows the user to weigh a sample of parts to compute an average unit weight and then determine the number of items being weighed by dividing the net weight by the unit weight value. The result is always a whole number of parts.

The balance has a preset number of parts to be used as a sample. These values are 10, 25, 50 or 100 items.

Steps:

1) Press **[Mode]** and then the **[Up]** or **[Down]** key to select parts counting, **"PARTS"** will be displayed
2) Enter parts counting by pressing **[Enter]**
3) Press the **[Up]** or **[Down]** key to select the sample size, "REF QTY", 10, 25, 50, 100, etc., then press **[Enter]** to confirm
4) When **"LOAD XX Pcs"** is shown place XX number of items on the pan and press **[Enter]** to compute the average piece weight. Display will indicate the busy symbol
5) Remove the sample when display shows **"XX Pcs"** and then place an unknown quantity on the pan. The balance will then compute the number of parts based upon the average piece weight. The display will show the result in Pcs
6) To count another item press **[Mode]** and continue from step 2.
7) To return to normal weighing, press **[Mode]** then press **[Esc]**

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8) During parts counting checks will be made to determine that the weight of the reference parts is large enough for reasonably accurate counting (weight of each piece should be > 1d)

7.2 PERCENT WEIGHING

Percent weighing will be done by defining a certain weight to be 100%. The weight to be used can either be entered by the user or taken from a sample.

Steps:

1) Press **[Mode]** and then the **[Up]** or **[Down]** key to select Percent weighing, **"PERCENT"** will be displayed

2) Press **[Enter]** to enter the function

3) Display will show, **"PERCENT SAMPLE"**

4) Press **[Enter]** to select the sample method (see step 5) or press the **[Up]** or **[Down]** key to select the manual entry of weight method (see step 9).

5) When **"LOAD 100 %"** is shown, add the sample

6) Press **[Enter]** to set this weight to be 100%, the busy symbol will turn on. When ready the display will show **"100%"**

7) Remove the sample and place an unknown sample to display the percentage weight

8) To set another weight as 100%, press **[Mode]** and continue from step 2 above.

9) To manually enter a value to be set as 100%, press **[Up]** or **[Down]** key when **"PERCENT SAMPLE"** is shown to select **"PERCENT Ent Wt"**

10) Press **[Enter]** to select the manually entered weight method

11) Enter the weight using the numeric entry method (see section 5.1)

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12) Place unknown sample to display the percentage weight

13) To perform percent weighing with another sample press **[Mode]** and continue from step 2 above.

14) To return to normal weighing, press **[Mode]** then press **[Esc].**

Note: Percentage will be displayed to the maximum number of decimal places based on the resolution of the balance. To increase or decrease by one decimal place, press the **[Up]** or **[Down]** key respectively.

7.3 CHECK WEIGHING

During weighing of a sample the balance can be set to show if the weight is above or below an upper and a lower limit. The display will use the arrows under the fill guide to show the check weighing is operating. The arrows and bars between the arrows will indicate when the weight is below the lower limit, between the limits or above the upper limit.

The buzzer can be set to be active when the weight is outside the limits (below the lower or above the upper) or within the limits (above the lower and below the upper limit), or turned off. If desired, only one limit needs to be set. If only one limit is set the other limit is considered to be zero (lower) or the maximum (upper).

The Check weighing is not active from zero to 20 scale divisions however the arrows will still be turned on below the fill guide and the weight will still be displayed.

Steps:

1) Press **[Mode]** and then the **[Up]** or **[Down]** key to select Check Weighing. When **"CHECK"** is displayed press the **[Enter]** key to enter Check Weighing mode

2) Press **[Up]** or **[Down]** to set the **"LOW LIMIT"** to **"On"** or **"OFF"**

3) Press **[Enter]** to proceed. If the **"LOW LIMIT"** was set to **"On"** the display will show the current low limit and allow you to change the limit using the numeric entry method (see section 5.1). The display will show the weigh in the current

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weighing unit. If the weighing unit is pounds: ounces the limit is set in decimal pounds, 1.500 lb = 1 lb 8oz.

4) Press **[Enter]** to proceed

5) If the **"LOW LIMIT"** was set to **"OFF"** or the setting of the low limit is complete, then the display will change to **"HIGH LIMIT"**. Use **[Up]** and **[Down]** to set the **"HIGH LIMIT"** to **"On"** or **"OFF"**

6) Press **[Enter]** to proceed

7) If the **"HIGH LIMIT"** was set to **"On"**, the display will show the current high limit which can be changed by using the numeric entry method (see section 5.1)

8) Press **[Enter]** to proceed

9) Next the beeper setting is displayed. Press **[Up]** or **[Down]** to scroll through the options –

10) **"BUZZER OFF"** (Beeper set to off at all times)

11) **"BUZZER In"** (Beeper will sound when the weight on the pan is within the limit) or

12) **"BUZZER Out"** (Beeper will sound when the weight on the pan is outside the set limits)

13) Confirm the beeper setting by pressing **[Enter]**

14) Press **[Enter]** again to start the Check Weighing

15) When a weight is placed on the pan now, the display will indicate whether the weight is below the LOW LIMIT between the LOW and HIGH LIMITS or higher than the HIGH LIMIT using the capacity tracker,

16) To perform check weighing with another sample press **[Mode]** and continue as before

17) To return to normal weighing, press **[Mode]** then press **[Esc]**.

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7.4 DENSITY DETERMINATION

It is possible to determine the density of solids or liquids using this mode. The user selects the type of density to be determined and then enters values to be used by the balance.

The density mode allows the user to use a special Density Kit or use the below pan weighing facility to perform the necessary weighing.

DENSITY OF SOLIDS

To perform the density of solids test, the user must have a method to immerse the sample in the chosen liquid. The density of the liquid must be known or determined from a look-up table.

For water and ethanol the density will be calculated based on the temperatures entered using the numeric entry method (see section 5.1)

Steps:

1) Press **[Mode]** and then **[Up]** and **[Down]** keys to select density
2) Press **[Enter]** to enter Density mode.
3) Press the **[Up]** and **[Down]** keys to select the solids or Liquid method when **"DENSITY SOLId"** or **"DENSITY LIqUId"** is displayed
4) Press **[Enter]** to select the solids method
5) Press **[Up]** or **[Down]** to select the liquid of choice- Water, Ethanol or Other
6) Press **[Enter]** to select the choice. For water and Ethanol the temperature will be asked for. Enter the temperature using the numeric entry method (see section 5.1)
7) For the "Other" choice the density will be asked for. Enter the density (g/cc) using the numeric entry method (see section 5.1)
8) Press **[Enter]** to continue

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9) The balance will request the weight of the sample in air by displaying **"AIR WEIGHT"**. Place the item on the pan or receptacle, if the density kit is used. Press **[Enter]** to determine the value

10) After completion of the air weighing, the balance will request the weight in liquid by displaying **"LIQUID WT"**. Submerge the item in the liquid and press **[Enter]** to start the liquid weighing. The balance will compute the density of the sample and display it as **"DENSITY XXXX g/cc"**

11) After completion of the liquid weighing, remove the item from the pan

12) Press **[Mode]** to continue with a new sample or press **[Esc]** to return to normal weighing

DENSITY OF LIQUID

When finding the density of a liquid, it is necessary to weigh a sample of known volume in air and then in the liquid. The volume of the sample must be entered by the user. The last known volume is stored for use at any time.

If using the density determination kit, the volume of the plumb is marked on its support, i.e. 10.123

Steps:

1) Press **[Mode]** and then **[Up]** and **[Down]** to select Density mode.

2) Press **[Enter]** to select the Density mode

3) Use **[Up]** and **[Down]** to scroll through the solid or liquid method

4) When **"DENSITY LIqUId"** is displayed, press **[Enter]** to enter the liquids method

5) The volume will be asked for. Enter the volume using the numeric entry method (see section 5.1) or continue using the last volume entered

6) Press **[Enter]** to continue

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7) The balance will request the weight in air by displaying **"AIR WEIGHT"**. Place the glass plumb supplied with the density determination kit in air on the weighing pan and press **[Enter]** to start the air weighing

8) On completion of the air weighing, the balance will request the weight in liquid by displaying **"LIQUID WT"**. Submerge the glass disk in the liquid and press the **[Enter]** key. The balance will compute the density of the liquid and display it. Remove the item from the pan

9) Press **[Mode]** to continue with a new sample or press **[Mode]** then **[Esc]** to return to normal weighing

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8.0 CALIBRATION

The PGL series can only be calibrated with an external mass.

8.1 MANUAL CALIBRATION

Pressing the **[Cal]** key will start calibration. Calibration can also be called for after a set time period as determined by the user (see section 12.5).

Calibration using External Calibration mass:

1) Pressing **[Esc]** will abort the calibration at any time
2) Check the display is at zero. Tare if necessary
3) Press the **[Cal]** key
4) The display will show the balance setting a new Zero condition by showing **"LOAD 0".** Make sure the pan is empty then press the **[Enter]** key to continue
5) The balance will then show the value of the calibration mass required sounding a beep, for example **"LOAD 1000 g"**
6) If a different mass is desired press the up or down arrow key to show the alternate masses possible for the scale.

	PGL 203	**PGL 303**	**PGL 2002**	**PGL 3002**	**PGL 4001**	**PGL 6001**	**PGL 8001**	**PGL 10001**	**PGL 20001**
Mass1	100 g	100 g	1000 g	1000 g	2000 g	3000 g	4000 g	5 kg	10 kg
Mass2	200 g	200 g	2000 g	2000 g	3000 g	4000 g	5000 g	10 kg	20 kg
Mass3		300 g		3000 g	4000 g	5000 g	6000 g		
Mass4						6000 g	7000 g		
Mass5							8000 g		

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7) Place the mass on the balance. Press **[Enter]** to continue

8) On the PGL 203 and PGL 303 models the display will show the busy symbol and after calibration is complete it will show "**LOAd 0**" on the display. Remove the weight. The scale will return to weighing.

9) All other models will return to weighing as soon as calibration is complete.

8.2 AUTOMATIC CALIBRATION

The balance will ask for calibration when the balance has automatic calibration enabled and the conditions of the automatic calibration have been met.

The calibration will be called for if the time since last calibration exceeds a preset time, typically 4 hours.

The balance will call for calibration to be carried out by flashing the **"CAL"** symbol on the display. As soon as the balance is calibrated the symbol will be turned off.

The Auto calibration feature can be enabled, disabled or changed by the user options to meet the requirements of the users. See section 12.5.

8.3 CALIBRATION ERRORS

Occasionally during calibration an error will be detected. These errors can be caused by:

- Unstable readings
- Improper calibration weights being used
- Large shifts of zero from the factory settings

When an error is found a displayed message will be shown and the calibration must be done again. If the balance has error messages more than once it is possible the mechanics have been damaged.

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8.4 CALIBRATION REPORT

The calibration report will show the details from the balance and give the user a place to sign showing he did the calibration.

<STX> CALIBRATION REPORT Ser No: AE435402 ID No: 123321 Date: 05/03/2008 Time: 18:41:57 Cal: External Mass: 2000g Calibration complete Signed: _____ <EOT>	The data for the form will be preceded by a start-of-text <STX> character (02H) and terminated with an end-of-transmission <EOT> character (04H). These characters will be ignored by a serial printer but will allow a computer program which reads the data to distinguish between this block report format and plain text. Carriage returns and line feeds complete each line.

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9.0 RS-232 INTERFACE

The balances have the ability to send or receive data over the serial interface.

The weighing data can be sent over the interface either automatically or when the user presses the **[Print]** key.

The user has control over what data is to be printed.

The following gives a description of the RS-232 interface.

9.1 HARDWARE

The RS-232 interface is a simple 3 wire connection. The input and output connections are:

Connector: 9 pin D-sub miniature socket

Pin 2 input to balance RXD

Pin 3 output from balance TXD

Pin 5 Signal ground GND

Handshaking is not applied.

Baud rate: 4800, 9600, 19200, 38400

Parity: NONE (=8N1), EVEN (=8E1) or ODD (=8 O 1)

All lines are terminated with carriage return and line feed (<CR><LF>).

In continuous output mode, or if single-line output on demand is selected, the serial output format will be a single line in the form “1234.567 g<CR><LF>”.

The format of the single-line output will change depending on the mode in which the balance is operating, as described below.

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If output on demand is selected, the user may optionally configure the serial output as a choice of 3 styles of form, either in a default format or in one of two custom formats. Each of the custom formats can be configured to output up to 15 lines of data. The data types that can be printed are:

NAME	**TEXT PRINTED**
ID number	ID no.: xxxxxxxxxxx
Serial number	Serial no. xxxxxxxxxxx
Date	DATE dd/mm/yyyy
Time	TIME hh:mm:ss
Net weight	Net: xxx.xxx g
Gross weight	Gross: xxx.xxx g
Tare weight	Tare: xxx.xxx g
Unit weight	Unit wt: xxx.xxx g
Count	Count: xxxx pcs
Reference weight	Ref. wt: xxx.xxx g
Percent	Percent: xx.xxx %
Checkweigh lower limit	Low: xxx.xxx g
Checkweigh upper limit	High: xxx.xxx g
A blank line printed	<CR><LF> only.

Any of these can be printed on any of the 15 lines available. Not all items need to be used and any one can be used more than once.

The data for each form will be preceded by a start-of-header <SOH> character (01) and terminated with an end-of-transmission <EOT> character (04). These characters will be ignored by a serial printer but will allow a computer program which reads the data to distinguish between this block report format and the single-line output format described above.

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9.2 STANDARD FORMAT

The balance will print the following data as the standard form. The standard form cannot be changed. The format of the custom forms #1 and #2 will be the same as the standard form until modified by the user.

Line 1	Date
Line 2	Time
Line 3	Blank line
Line 4	ID number
Line 5	Blank line
Line 6	Result
Line 7	Blank line
Line 8	Blank line

This will result in a printout that looks like:

Date: 23/09/04

Time: 15:45

ID No: 123456

NOTE:

The format of the results line will change depending on the mode in which the balance is operating, e.g.

Normal weighing, Check weighing: “123.456 g”

Parts counting: “1234 pcs”

Percent weighing: “12.345 %”

9.3 INPUT COMMANDS USING REMOTE KEYS

The balance can be controlled with the following commands sent using remote keys such as from a PC. The commands must be sent in upper case letters, i.e. **“KT”** not **“kt”**. Press the Enter key of the PC after each command (the action of Carriage Return is denoted as <CR> as shown below).

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Basic Input Commands:

!KT<CR>	Tares the balance to display the net weight. This is the same as pressing the **[Zero / Tare]** key when the balance is in the normal weighing mode.
!KP<CR>	Transmits data over RS-232 interface. This is the same as pressing the **[Print]** key when the balance is in the normal weighing mode.

removed unused commands

Invalid Input Command:

If an invalid command is received, then the command is returned as follows-

Invalid Command	**Message returned**	**Remarks**
!NT<CR>	!EU<CR>	Command character is not 'K'
!KK<CR>	!EK<CR>	Key character is not 'T' or 'P'
!KT-<CR>	!EF<CR>	Command format error, <CR> is not the fourth character
KT<CR> or !KT -	No reply	Either '!' or <CR> is missing in the command string

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10.0 BATTERY OPERATION

The scale may operate from a built in lead acid battery. During operation with the battery the backlight should be disabled for best battery life. Typical battery life 20 hours.

If possible disable the backlight automatically if the external power supply is not turned on.

11.0 ERROR CHECKING

During weighing the balance is constantly checking to see if the balance is operating within the limited parameters. The errors likely to occur are:

A/D counts below lowest allowed value

A/D counts above highest allowed value

A/D not operating

Maximum capacity exceeded

Other errors may be detected during special functions or operations. These will be described in the section that applies.

Error messages and the reasons are:

Concerning calibration	
ERROR StAb	Calibration could not be completed because the results were not stable
ERROR LOW or ERROR HIGH	Calibration constant not within 20% of old calibration constant
Concerning weighing	
ERROR LOW	Weight display is below zero by >4%max
ERROR HIGH	Weight is above maximum plus 90d
ERROR ZERO	Weight on pan exceeds zero limit when power is applied.

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12.0 SUPERVISOR MENUS

Pressing the **[Setup]** key while in normal weighing gives access to the menus.

1) When **[Setup]** is pressed and passcodes are not enable the display will show the message **"SUPERVISOR"**. If passcodes are enabled, the balance will ask for it by displaying **"PASSCODE 0"**

2) If a wrong code is entered an **"ERROR CODE"** message will flash and the balance will return to weighing mode

3) If the passcode has been enabled and entered, the balance will allow the operator to access the Supervisor's menus

4) When the display shows **"SUPERVISOR"** press **[Enter]** to view the topics that can be modified

5) From this menu the user can enable/disable weighing units or modes, set balance parameters for the conditions, set time and date, set parameters for the RS-232 interface, calibration parameters and security parameters

6) The **[Up]** and **[Down]** keys will cycle through the main headings, pressing the **[Enter]** key will enter the heading and sub-parameters or options can be set. Press **[Mode]** to come out of a sub-menu or to **[Esc**] to return to normal weighing from any menu

12.1 ENABLE WEIGHING UNITS

1) When **"UNITS"** is displayed, press **[Enter]**. The display will show the symbol for the first unit, e.g. kilogram, kg, together with its enable state "OFF" or "On". The user can then enable or disable the carats unit by using **[Up]** or **[Down]**. Pressing **[Enter]** will confirm the setting and will advance to the next weighing unit. Repeat for each weighing unit in turn. Gram is always set to "On"

2) Press **[Mode]** to advance to setting of the next menu or press **[Esc]** to return to normal weighing

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12.2 ENABLE WEIGHING MODES

Same steps are followed to enable or disable the weighing modes.

1) Press **[Enter]** when **"MODES"** is displayed. The display will show the first mode i.e., Parts Counting ("PARTS") together with its enabled state "OFF" or "On". The user can enable or disable the parts counting mode by using **[Up]** or **[Down]**. Pressing **[Enter]** will confirm the setting and will advance to the next weighing mode. Repeat for each mode in turn

2) Press **[Mode]** to advance to setting of the next menu or press **[Esc]** to return to normal weighing

12.3 ENABLE SERIAL INTERFACE PARAMETERS

The parameters affecting the serial setup are set in a similar manner to the other parameters.

Press **[Enter]** when **"SERIAL"** is displayed to enter the sub-menu.

The parameters that can be set are:

ENABLE	The serial port can be set to On or OFF
BAUD RATE	Set the Baud Rate to 4800, 9600, 19200 or 38400
PARITY	Set the Parity to NONE, EVEN or ODD 8 data bits and one stop bit are always used, (8n1, 8E1, 8o1).
STABLE	To print when stable (On) or regardless of stability (OFF)
CONTINUOUS	Set the RS-232 to send data continuously to On or OFF
PERIODIC	Set the RS-232 to send data periodically (set in seconds) to On or OFF. If On is selected, the value can be changed between 1 and 999 seconds, using **[Up]** and **[Down]**
FORMAT	To send data as a single line of data, using the standard format or using a customer designed format (FORM 1 or FORM 2). During continuous or periodic printing only the weight is printed. Forms are not available.

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Format of custom forms #1 and #2

If FORM1 or FORM2 is selected, it can be changed by the user using a selection of available data. By default the 2 forms are the same as the standard form unless changed by the user as below.

When FORM 1 or FORM 2 is selected the user can set the information to be printed on each line of the form. Pressing the **[Up]** or **[Down]** keys will cycle through the options available. The options are:

INST ID	Instrument ID number
SER No	Serial Number
TIME	Time
DATE	Date
NET	Net Weight (Gross weight – Tare Weight)
GROSS	Gross Weight
TARE	Tare Weight
UNIT	Unit weight in parts counting mode
COUNT	Number of items in parts counting mode
REF	100% weight in percent weighing mode
PERCENT	Percentage of reference weight in percent weighing
LO LIMIT	Low Limit when check weighing
HI LIM	High Limit when check weighing
Cr Lf	Inserts a blank line
END	Signifies the end of the report When END is entered the display returns to the RS-232 Sub-menu

Enter the data to be printed on the first line by pressing the **[Up]** or **[Down]** key to cycle through the options. If the current information is OK then press the **[Setup/Enter]** key to move to the next line.

e.g. “LINE No1” “DATE” - prints date

Select a code for one of the preset data formats as detailed above.

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The next line shows: “LINE NO 2” “TIME” - prints time

Only one item can be entered per line.

Continue until the formatting of the form is complete. There are 15 lines of possible data. After the 15th line has been set or “END” has been selected, the balance will return to the RS-232 Sub-menu.

Press **[Mode]** to advance to setting of the next menu or press **[Esc]** to return to normal weighing.

12.4 SETUP PARAMETERS

The user parameters that control the balance are shown under the SETUP. When **“SETUP”** is displayed, press the **[Setup/Enter]** key. The options for each parameter can be scrolled through by using the **[Up]** or **[Down]** key.

TIME	Set Time using the numeric entry method (see section 5.1)
DATE DATE FORM EUROPE (dd/mm/yy) USA (mm/dd/yy) ASIA (yy/mm/dd)	Set Date using the numeric entry method (see section 5.1)
USER ID	Enter a user number to identify the user or the balance
BUZZER	On= Enable OFF= Disable
BACKLIGHT	On OFF AUTO
POWER DOWN	Set the time after which the unit will go into Stand-by power settings, On=Enable, OFF=Disable, If set to On-the options are 1 to 9 minutes
FILTER	Set a value for the amount of filtering to be done, set to normal, slow or fast.
STABILITY	Set a value to be used to determine balance stability, set a value of 1, 2, 5 or 10d. A larger number corresponds to a larger stable zone.
AUTO ZERO	Can be set to On or OFF to enable the auto-zero function. If set to On- select from 1, 2 or 5d

The sub-menu is entered by pressing **[Enter]** –

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1) Use the **[Up]** and **[Down]** keys to increase or decrease the value for setting. Press **[Enter]** to accept the setting and advance to the next item in the menu

2) Press **[Mode]** to advance to setting of the next parameter or **[Esc]** to return to normal weighing

12.5 CALIBRATION SETUP

This menu allows the user to set the calibration parameters.

Press **[Enter]** when **"CAL SETUP"** is displayed to select the calibration parameters

The options for each parameter can be scrolled through by using the **[Up]** or **[Down]** key

ENABLE	NO =operator calibration is disabled YES=operator calibration is enabled
CAL REPORT	On = Enabled. Prints out Calibration report after successful calibration OFF = Disabled
TIME CAL	On = Enabled. Select time from 1 to 24 hours. OFF = Disabled

Press **[Mode]** to advance to setting of the next menu which is **"PASSCODES"** or **[Esc]** to return to normal weighing.

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12.6 PASSCODES

To enable the security features in this balance it is necessary to set passcodes. There are 2 passcodes called Operator Passcode and Supervisor Passcode. The Operator Passcode allows an authorised user to operate the basic weighing functions of the balance but will not allow access to the Supervisor Menus if the Supervisor Passcode has been set.

To change or disable a Passcode it will be necessary to enter the current passcode.

Press **[Enter]** when **"PASSCODES"** is displayed to enter this section.

Select either Operator or Supervisor passcode using the [Up] or [Down] keys.

Press [Enter] to select the passcode to change.

Press **[CAL]** to enter the current passcode (OLD) first then enter a new passcode if desired. Use the numeric entry method (see section5.1). A passcode set to zero will disable the security feature and allow unlimited access.

Forgotten Passcodes

Keep a record of the passcode to ensure you can access this section again. If however you have forgotten your passcode you can still gain access by entering a universal code.

If you have forgotten the current passcode a code of "15" will always allow you to enter the Supervisor area.

Using the Supervisor menus go to the PASSCODE section and reset the operator or Supervisor passcode using the "15" code as the old number when asked.

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13.0 SPECIFICATIONS

	PGL 203	PGL 303	PGL 2002	PGL 3002
Maximum Capacity	200 g	300 g	2000 g	3000 g
Readability	0.001 g	0.001 g	0.01 g	0.01 g
Repeatability (s.d.)	0.002 g	0.003 g	0.02 g	0.03 g
Linearity ±	0.004 g	0.006 g	0.04 g	0.06 g
Pan	145 x 125 mm / 5.7 " X 7.6"		192×192mm / 7.6" x 7.6"	
Units of Measure	grams, milligram, carat, grains, Newtons, troy ounce, pennyweights, ounce, and custom		grams, kilograms, carat, grains, Newtons, troy ounce, pennyweights, ounce, and custom	
Functions	Weight, percent weighing, parts counting, check weighing , density determination			
Overall Dimensions (wxdxh)	251 × 358 × 104 mm 9.9" x 14.1" x 4.1"			
Net Weight	4 kg / 8.8 Lb.			

	PGL 4001	PGL 6001	PGL 8001
Maximum Capacity	4000 g	6000 g	8000 g
Readability	0.1 g	0.1 g	0.1 g
Repeatability (s.d.)	0.2 g	0.2 g	0.2 g
Linearity ±	0.4 g	0.4 g	0.4 g
Pan	192×192mm / 7.6" x 7.6"		
Units of Measure	grams, kilograms, carat, grains, Newtons, pounds, ounces, pound:ounce, and custom		
Functions	Weight, percent weighing, parts counting, check weighing , density determination		
Overall Dimensions (w x d x h)	251 × 358 × 104 mm 9.9" x 14.1" x 4.1"		
Net Weight	4 kg / 8.8 Lb.		

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	PGL 10001	PGL 20001
Maximum Capacity	10 kg	20 kg
Readability	0.1 g	0.1 g
Repeatability (s.d.)	0.2 g	0.2 g
Linearity ±	0.4 g	0.4 g
Pan	400 x 300 mm 15.7” x 11.8”	
Units of Measure	grams, kilograms, carat, grains, Newtons, pounds, ounces, pound:ounce, and custom	
Functions	Weight, percent weighing, parts counting, check weighing , density determination	
Overall Dimensions (wxdxh)	455 × 400 × 95 mm 17.9” x 15.7” x 3.7”	
Net Weight	6 kg / 13.2 Lb.	

Common Specifications:

Date and Time	Battery backed real time and date standard
Weigh below	Standard access point
Interface	RS-232, bi-directional
Stabilization Time	2 Seconds typical
Operating Temperature	0°C - 40°C 32ºF – 104ºF
Battery	Lead Acid Rechargeable
Power supply	12VDC / 500 mA (min)
Calibration	Automatic External

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14.0 WARRANTY STATEMENT

Adam Equipment offers Limited Warranty (Parts and Labor) for the components failed due to defects in materials or workmanship. Warranty starts from the date of delivery.

During the warranty period, should any repairs be necessary, the customer must inform the supplier or Adam Equipment. The company or its authorised Technician reserves the right to repair or replace any components at its own discretion. Any shipping costs involved in sending the faulty units to a service centre is the customers responsibility.

The warranty will cease to operate if the equipment is not returned in the original packaging and with correct documentation for a claim to be processed. All claims are at the sole discretion of Adam Equipment.

This warranty does not cover equipment where defects or poor performance is due to misuse, accidental damage, exposure to radioactive or corrosive materials, negligence, faulty installation, unauthorised modifications or attempted repair or failure to observe the requirements and recommendations as given in this User Manual.

Repairs carried out under the warranty does not extend the warranty period. Components removed during the warranty repairs become the company property.

The statutory right of the purchaser is not affected by this warranty. The terms of this warranty is governed by the UK law. For complete details on Warranty Information, see the terms and conditions of sale available on our web-site

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CE

Manufacturer's Declaration of Conformity

This product has been manufactured in accordance with the harmonised European standards, following the provisions of the below stated directives:

Electro Magnetic Compatibility Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

Adam Equipment Co. Ltd.
Bond Avenue, Denbigh East
Milton Keynes, MK1 1SW
United Kingdom

FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded interconnect cables must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device.

Changes or modifications not expressly approved by Adam Equipment could void the user's authority to operate the equipment.

WEEE COMPLIANCE

Any Electrical or Electronic Equipment (EEE) component or assembly of parts intended to be incorporated into EEE devices as defined by European Directive 2002/95/EEC must be recycled or disposed using techniques that do not introduce hazardous substances harmful to our health or the environment as listed in Directive 2002/95/EC or amending legislation. Battery disposal in Landfill Sites is more regulated since July 2002 by regulation 9 of the Landfill (England and Wales) Regulations 2002 and Hazardous Waste Regulations 2005. Battery recycling has become topical and the Waste Electrical and Electronic Equipment (WEEE) Regulations are set to impose targets for recycling.

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Adam products are predominantly designed for the Laboratory, Educational, Medical, retail and Industrial Segments. The product range can be described as follows:

-Analytical and Precision Balances
-Compact and Portable Balances
-High Capacity Balances
-Moisture analysers / balances
-Mechanical Scales
-Counting Scales
-Digital Weighing/Check-weighing Scales
-High performance Platform Scales
-Crane scales
-Medical Scales
-Retail Scales for Price computing

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